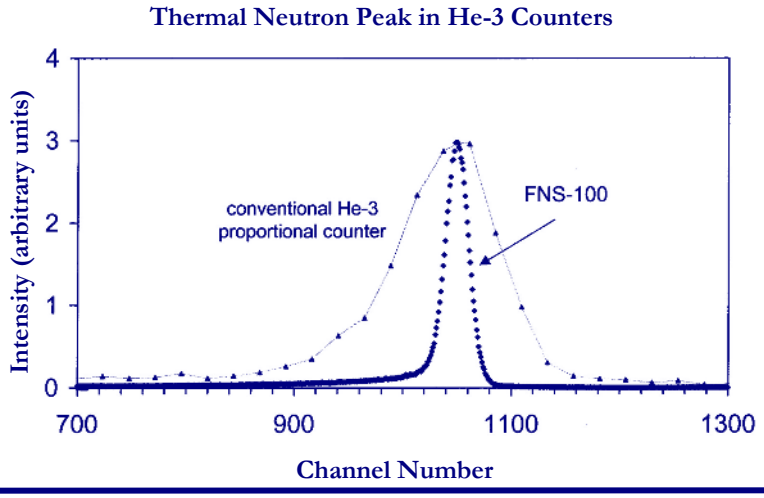
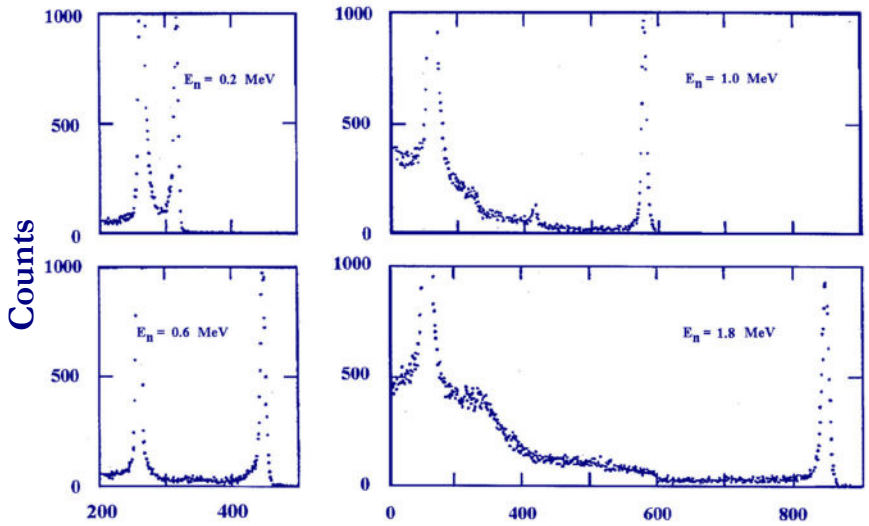
FNS-100™
Fast Neutron Spectrometer



- **Unsurpassed resolution < 20 keV (thermal peak)**
- **Matched preamplifier**
- **Notch filter for reduction of microphonics**
- **Compact, lightweight**

The BTI FNS-100 is a high efficiency, high resolution fast neutron spectrometer. The detector is a multi-wire ^{3}He ion chamber with a dense quenching gas. The availability of both high efficiency and exceptional resolution in one instrument makes the FNS-100 useful for nuclear science and engineering, materials research and radiation protection.

The FNS-100 is supplied with an integral cadmium and boron shield to reduce its sensitivity to thermal neutrons. The residual thermal neutron peak is a convenient feature for energy calibration and stability monitoring. The FNS-100 spectrometer, as provided with custom preamplifier and notch filter, is fully compatible with standard spectroscopy electronics (not provided) like those used with Ge spectrometer systems.



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FNS-100™
Technical Specifications

(Visit www.bubbletech.ca for more information)

PERFORMANCE

Spectral Range: 0.1-5.0 MeV

Resolution:

Thermal: < 20 keV FWHM
1 MeV: < 30 keV FWHM

Absolute detection efficiency at 1 MeV: $3x10^{-4}$ peak counts per unit incident neutron fluence

PHYSICAL SIZE

Detector: 6.4 x 57.4 cm (diameter x length) (2.5 x 22.6 in)

Effective Length: 15 cm (5.9 in)

Preamplifier: 11.0 x 8.0 x 4.0 cm

POWER REQUIREMENTS

Anode Bias: +3000V

Grid Bias: +850V

Preamplifier: ± 12V (NIM std)

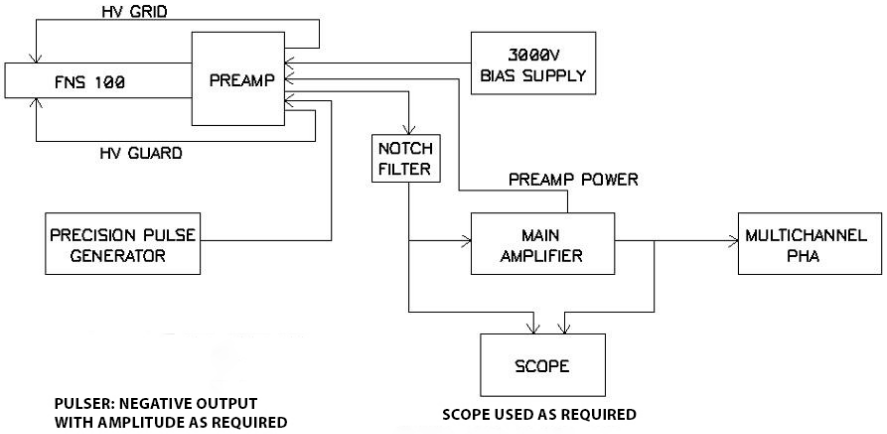
PREAMPLIFER OUTPUT

Amplitude: 12 mV/MeV

Impedance: 50 Ω

Risetime: 0.2 to 5 μs (10 to 90%)

Falltime: Approximately 1 ms



Typical measurement set-up
(only FNS-100, preamp, notch filter provided)

OTHER NEUTRON SPECTROMETERS:

BDS

The BDS is a complete low-cost neutron spectrometer package consisting of 36 Bubble Detectors that have been specifically formulated with six different energy thresholds. Each spectral measurement can be made with 18 detectors (3 of each threshold supplied – 10, 100, 600, 1000, 2500, 10000 keV). A simple algorithm is included for "unfolding" the neutron measurement data. Detectors can be re-used through recompression in a pressure chamber (available from BTI).

ROSPEC

The ROSPEC (**RO**tating neutron **SPEC**trometer) is intended for "standards" laboratories and large nuclear establishments that need to characterize neutron spectra (thermal to fast) to the highest standard (energy resolution and absolute fluence) that is technically feasible. ROSPEC is used as a secondary standard to establish the reference neutron field for a variety of applications, including verification of neutron transport calculations.
ROSPEC is based on spherical counters filled with different pressures of hydrogenous gas (to cover different high energy regions) plus bare and ^{10}B - covered ^{3}He counters to span thermal and epi-thermal energies. ROSPEC is regarded by neutron experts as the premier spectrometer and is, in fact, the reference neutron spectrometer adopted by NATO scientists.

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